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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/578,769

01/29/2007

Ken Takei

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6221

38327

7590

03/26/2008

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EXAMINER

DUONG, DIEU HIEN

ART UNIT

PAPER NUMBER

2821

MAIL DATE

DELIVERY MODE

03/26/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/578,769	<b>Applicant(s)</b> TAKEI ET AL.	
	<b>Examiner</b> DIEU HIEN T. DUONG	<b>Art Unit</b> 2821	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 January 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>05/09/2006</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Status of Application***

1. This Office Action is a response to Applicant's Preliminary Amendment filed on 01/29/2007. In virtue of this Preliminary Amendment, claims 14-16 are canceled; thus, claims 1-13 and 17 are currently presented in the instant application.

### ***Inventorship***

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

### ***Priority***

3. Acknowledgement is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

### ***Information Disclosure Statement***

4. The information disclosure statement (IDS) submitted on 05/09/2006 in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is considered by the examiner.

If applicant is aware of any prior art or any other co-pending application not already of record, he/she is reminded of his/her duty under 37 CFR 1.97 to disclose the same.

***Drawings***

5. The drawing submitted on 01/29/2007 is accepted as part of the formal application.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-13 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1:

Line 12, the recitation "the plurality of frequencies" is unclear. It is not clear that "the plurality of frequencies" refers to "a plurality of frequencies" in line 6 or "a plurality of frequencies" in line 9 of claim 1.

Regarding claim 2: claim 2 is rejected since it depends on indefinite claim 1.

Regarding claim 3:

Line 2, the recitation "the plurality of frequencies" is unclear. It is not clear that "the plurality of frequencies" refers to "a plurality of frequencies" in line 6 or "a plurality of frequencies" in line 9.

Lines 2-6, the recitation “the total length of the plurality of transmission lines is shorter than the sum of a quarter wavelength of an electromagnetic wave of a first frequency and a half wavelength of an electromagnetic wave of a second frequency higher than the first frequency” is unclear. It is not clear that the “first frequency” and the “second frequency” are the frequencies of the antenna, the plurality of the transmission lines, the one transmission line or the frequencies of the combination. Therefore, the total length of the plurality of the transmission lines can not be determined. Moreover, how the total length of the transmission lines can be made since the transmission lines is expressed in length (for example, in meter) comparing to the sum of the frequencies (for example, in hertz).

Regarding claim 4:

The deficiencies are found which require similar clarifications to claim 3.

Regarding claim 5:

Line 2, the recitation “the plurality of frequencies comprise n frequencies” is unclear. It is not clear what “n” stands for.

Line 5, the recitation “electromagnetic waves of second, third, fourth, ...and n-th frequencies” is unclear. It is not clear what “..... and n-th frequencies” stands for.

Lines 2-6, the deficiencies are found required similar clarifications to claim 3.

Regarding claim 7:

The deficiencies are found in lines 2-13 required similar clarification to claims 1 and 3.

Lines 14-19, the recitation “wherein, when the plurality of frequencies are composed of more than three frequencies, the plurality of transmission lines include a third transmission line whose one end is connected to the feeding point and whose other end is connected to a second branching point, a fourth transmission line connected between the second branching point and a third branching point, and a fifth transmission line connected to the third branching point” is unclear. It is not clear how the “one end of the third transmission line” is connected to the feed point since line 3 recites “a single feeding point” and lines 11-12 recites “a first transmission line whose one end is connected to the feeding point”. In the other words, how “a single feeding point” can connect to both ends of the first transmission line and third transmission.

Regarding claims 8-13 and 17:

The deficiencies are found in claims 8-13 and 17 required similar clarifications to claims 1, 3-5 and 7.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-12 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barna et al. (US 6,611,235), hereinafter "Barna" in view of Onaka et al. (US 6,600,449 B2).

Regarding claims 1, 7 and 17, as best understood, Barna discloses, in Figure 20, a portable wireless terminal comprising an antenna incorporated therein, the antenna comprising: a ground conductor having a ground potential; a single feeding point whose one end is formed by a part of the ground conductor; and a plurality of transmission lines to which RF power supplied to the feeding point is input, for radiating electromagnetic waves of a plurality of frequencies into space, wherein the plurality of transmission lines include a transmission line for radiating electromagnetic waves of a plurality of frequencies commonly into space, wherein, when the plurality of frequencies are composed of two frequencies, the plurality of transmission lines include a first transmission line whose one end is connected to the feeding point and whose other end is connected to a first branching point, and a second transmission line connected to the first branching point, wherein, when the plurality of frequencies are composed of more than three frequencies, the plurality of transmission lines include a third transmission line whose one end is connected to the feeding point and whose other end is connected to a second branching point, a fourth transmission line connected between the second branching point and a third branching point, and a fifth transmission line connected to the third branching point.

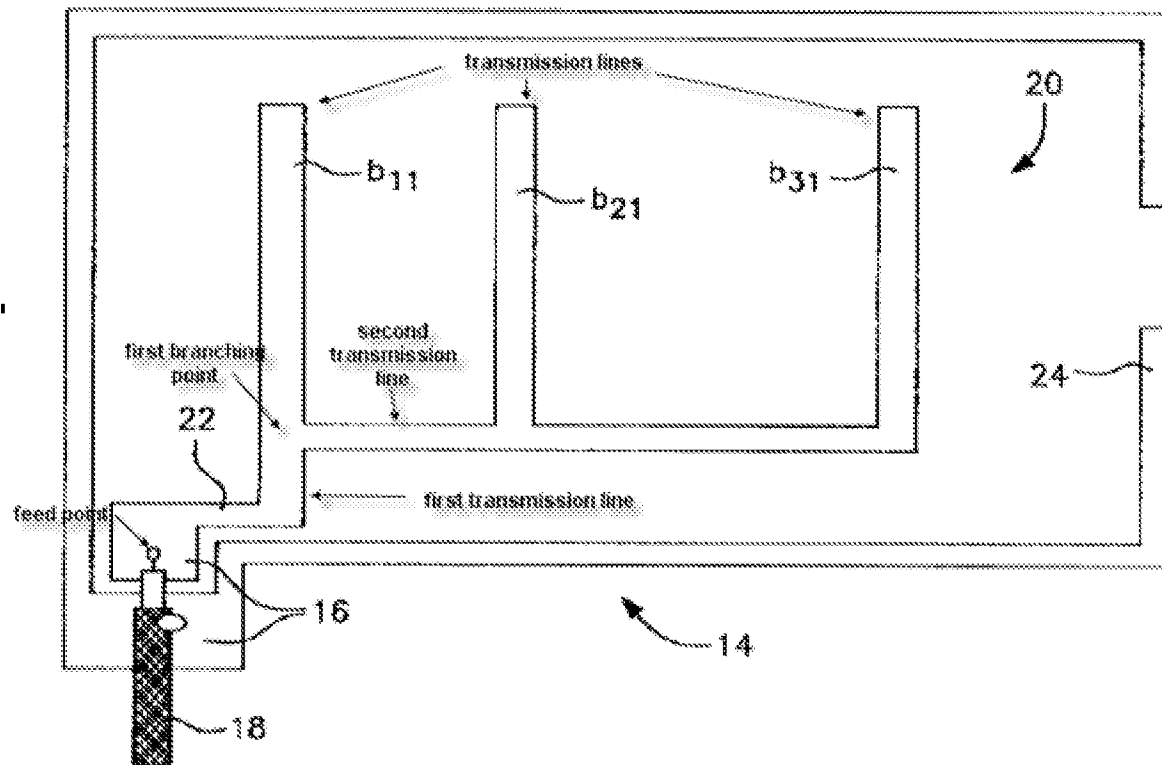
Barna does not disclose, respective lengths of the plurality of transmission lines being set so that impedance matching is performed at the feeding point with respect to the plurality of frequencies.

Onaka discloses, in col.2, lines 7-22, wherein respective lengths of the plurality of transmission lines are set so that impedance matching is performed at the feeding point with respect to the plurality of frequencies.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the antenna device of Barna with the lengths of the transmission lines being set to perform the impedance matching at the feeding point with respect to the frequencies as taught by Onaka, doing so would allow the maximum power to be supplied from the signal source to the transmission lines to increase the gain of the transmissions lines (col. 2, lines 7-22).



FIG. 20



Regarding claims 2 and 8, as best understood, Barna/Onaka disclose, (Barna, Figure 20), wherein the ground conductor, the feeding point and the plurality of transmission lines are formed of an integrated metal plate.

Regarding claims 3 and 9, as best understood, Barna/Onaka disclose (Barna, Fig. 20), wherein when the plurality of frequencies are composed of two or three frequencies, the total length of the plurality of transmission lines is shorter than the sum of a quarter wavelength of an electromagnetic wave of a first frequency and a half wavelength of an electromagnetic wave of a second frequency higher than the first frequency.

Regarding claims 4 and 10, as best understood, Barna/Onaka disclose, (Barna, Fig. 20), wherein when the plurality of frequencies are composed of three frequencies, the total length of the plurality of transmission lines is shorter than the sum of a quarter wavelength of an electromagnetic wave of a first frequency and half wavelengths of electromagnetic waves of second and third frequencies that are higher than the first frequency.

Regarding claims 5 and 11, as best understood, Barna/Onaka disclose, (Barna, col. 2, lines 4-18), wherein when the plurality of frequencies comprise  $n$  frequencies, the total length of the plurality of transmission lines is shorter than the sum of a quarter wavelength of an electromagnetic wave of a first frequency and half wavelengths of electromagnetic waves of second, third, fourth, . . . and  $n$ -th frequencies that are higher than the first frequency.

Regarding claims 6 and 12, as best understood, Barna/Onaka disclose, (Barna, Fig. 20), wherein the ground conductor is located on one side of one of the plurality of transmission lines.

10. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barna et al. (US 6,611,235), hereinafter "Barna" in view of Onaka et al. (US 6,600,449 B2), hereinafter "Onaka" and further in view of Nagumo et al. (US 2002/0163470 A1), "Nagumo".

Regarding claim 13, as best understood, Barna/Onaka disclose every feature of claimed invention except for further comprising a transmission line for impedance adjustment connected to at least one of the feeding point and the branching point.

Nagumo discloses, in Figure 3A, further comprising a transmission line for impedance adjustment connected to at least one of the feeding point and the branching point.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the transmission line of Nagumo in the antenna device of Barna and Onaka to achieve the claimed invention, doing so would allow the maximum power to be supplied from the signal source to the transmission lines to increase the gain of the transmissions lines (Onaka, col. 2, lines 7-22).

### ***Inquiry***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DIEU HIEN T. DUONG whose telephone number is (571)272-8980. The examiner can normally be reached on Monday - Friday, from 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas W. Owens can be reached on 571-272-1662. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2821

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

03/15/08

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AU 2821

/Trinh Vo Dinh/

Primary Examiner, Art Unit 2821